

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) ~~A high gain, broadband, directive,~~ An active antenna system for the reception of signals, the system comprising:

a ~~substantially linear, balanced, high-impedance,~~ differential voltage amplifier subassembly utilizing a passive lossless feedback circuit; ~~for gain scalability, high linearity, and elevated input impedance;~~

a subassembly having a pair of dipole probe elements ~~subassembly~~ connected to the differential voltage amplifier for producing an electric field sensing transduction mechanism for the reception of signals; ~~and~~

a ~~tuned~~ scatter-plate subassembly ~~configured~~ that is tuned to direct received signals onto ~~said~~ the pair of dipole probe elements subassembly; ~~[[.]]~~

a bias decoupling inductor to reduce noise contribution of the differential voltage amplifier;

wherein an inductance value of the decoupling inductor is selected such that an RF voltage peaking effect is obtained at a transistor input at a desired frequency.

2. (Currently Amended) The ~~active antenna system~~ of claim 1, wherein the passive lossless feedback circuit comprises a ~~wire-wound~~ transformer connected to a Field Effect Transistor (FET) or a high impedance transistor, and wherein a gain of the differential voltage amplifier ~~gain~~ is scaled by turn-ratio of the transformer ~~turn-ratio~~.

3. - 4. (Cancelled)

5. (Currently Amended) A high gain, broadband, directive, active antenna comprising:

a substantially linear, balanced, high-impedance, differential voltage amplifier subassembly utilizing passive lossless feedback ~~for gain scalability, high linearity, and elevated input impedance;~~

~~a pair of dipole probe elements~~ subassembly having a pair of dipole elements connected to the amplifier for producing an electric field sensing transduction mechanism; and

a ~~tuned~~ scatter-plate subassembly, wherein the scatter-plate subassembly is tuned such that separate directive modes occur at desired areas of the RF frequency spectrum by distancing of the scatter-plate from driven elements, controlling effective inductance of the scatter-plate, or a combination of both, and wherein the scatter-plate effective inductance is affected by material properties and geometry.

6. (Currently Amended) The ~~active antenna~~ system of claim 1, wherein directivity is achieved by combining multiple subassemblies into fixed or steerable arrays; by combining a driven subassembly with a non-driven director element; or by combining a driven subassembly with any number of non-driven director elements and a scatter-plate/reflector assembly, or by a combination thereof.

7. (Currently Amended) A high gain, broadband, directive, active antenna comprising:

a substantially linear, balanced, high-impedance, differential voltage amplifier subassembly utilizing passive lossless feedback for gain scalability, high linearity, and elevated input impedance;

~~a pair of dipole probe elements~~ subassembly having a pair of dipole elements connected to the amplifier for producing an electric field sensing transduction mechanism; and

a tuned scatter-plate subassembly, wherein for broadband TV reception, the scatter-plate dimensions and proximity to antenna amplifier and probe elements are chosen such that the antenna exhibits a minimum front to back directive ratio (FIB) of about +8dB at High VHF and UHF frequencies and to achieve similar directive properties at lower frequencies if the scatter-plate geometry is tuned appropriately for such frequencies..

8. (Currently Amended) The ~~active-antenna system~~ of claim 1, wherein in a towards lower half of a bandwidth of interest, the system is operational antenna ~~operates~~ in a directive, capacitively-coupled loop mode in which fringing electric fields at ends of the ~~antenna~~ pair of dipole probe elements capacitively couple to the scatter-plate and create a directive loop effect and in a towards upper half of the bandwidth of interest the system is operational ~~antenna operates~~ in a reflector mode, and wherein the scatter-plate is tuned such that these separate directive modes occur at convenient areas of the RF frequency spectrum.

9. (Currently Amended) ~~A broadband directive reception~~ An antenna system for broadband directive reception, the antenna system, comprising:

a ~~substantially linear, balanced, high-impedance, differential voltage amplifier~~ subassembly with ~~passive~~ lossless feedback;

a dipole probe subassembly connected to the differential voltage amplifier for producing an electric field sensing transduction mechanism for the reception of signals; and

a tuned scatter-plate subassembly ~~configured~~ that is tuned to direct received signals onto ~~said the~~ dipole probe subassembly; [[.]]

the lossless feedback is provided by using a wire-wound transformer connected to a high impedance transistor;

the differential voltage amplifier gain is scaled by turn-ratio of the wire-wound transformer;

a bias decoupling inductor is used to reduce noise contribution of the differential voltage amplifier to the antenna system; and
an inductance value of the bias decoupling inductor is such that an RF voltage peaking effect is obtained at a transistor input at a desired frequency.

10. (Cancelled)

11. (Currently Amended) A broadband directive antenna system comprising:

at least a substantially linear, balanced, high-impedance, differential voltage amplifier subassembly with passive lossless feedback;

a dipole probe subassembly connected to the amplifier for producing an electric field sensing transduction mechanism; and

a ~~tuned~~ scatter-plate subassembly, wherein the scatter-plate subassembly is tuned by distancing of the scatter-plate from driven elements, controlling effective inductance of the scatter-plate, or a combination of both, and wherein the scatter-plate effective inductance is affected by material properties and geometry.

12. (Previously Presented) The system of claim 11, wherein directivity is achieved by combining multiple subassemblies into fixed or steerable arrays; by combining a driven subassembly with a non-driven director element; or by combining a driven subassembly with one or more non-driven director elements and a scatter-plate subassembly, or by a combination thereof.

13. (Previously Presented) The system of claim 11, the antenna configured to operate in a directive, capacitively-coupled loop mode in which fringing electric fields at ends of the antenna probe elements capacitively couple to the scatter-plate subassembly and create a directive loop effect and towards upper half of the bandwidth of interest the antenna operates in a reflector mode, and wherein the scatter-plate is

tuned such that these separate directive modes occur at convenient areas of the RF frequency spectrum.

14. (Currently Amended) ~~A high gain, broadband, directive, An active antenna system~~ the system comprising:

means for amplifying received signals; ~~signals received by probing means~~;

wherein the amplifying means is substantially linear, balanced, and high-impedance;

means for probing radio frequency signals,

wherein the probing means is connected to the amplifying means for the reception of radio frequency signals; and

means for creating directivity with separate frequency-dependant, directive modes, said means for creating directivity is configured to direct the received radio frequency signals onto the means for probing radio frequency signals; [[.]]

a decoupling inductor to reduce noise contribution of the amplifying means to the antenna, and wherein inductance value of the decoupling inductor is such that an RF voltage peaking effect is obtained at a transistor input at a desired frequency.

15. (Currently Amended) The ~~active-antenna system~~ system of claim 14, wherein the amplifying means comprises a differential voltage amplifier with ~~passive~~ lossless feedback, wherein the lossless feedback is provided via ~~comprises a wire-wound~~ transformer connected to a high impedance transistor, and wherein gain of the differential voltage amplifier ~~gain~~ is scaled by turn-ratior of the transformer ~~turn-ratio~~.

16. (Currently Amended) The ~~active-antenna system~~ system of claim 14, wherein the probing means is connected to the amplifying means to produce an electric field sensing transduction mechanism.

17. (Cancelled)

18. (Currently Amended) A high gain, broadband, directive, active antenna comprising:

means for probing radio frequency signals,

~~wherein the probing means is connected to the amplifying means;~~

means for amplifying signals received by the probing means,

wherein the amplifying means is substantially linear, balanced, and high-impedance; and

means for creating directivity with separate frequency-dependant, directive modes,

wherein the means for creating directivity is tuned such that separate directive modes occur at desired areas of the RF frequency spectrum by distancing of the means for creating directivity from driven elements, controlling effective inductance of the means for creating directivity, or a combination of both, and

wherein the effective inductance of the means for creating directivity ~~effective inductance~~ is affected by material properties and geometry.

19. (Currently Amended) An ~~active-reception~~ antenna for reception of signals, the antenna, comprising:

a substantially linear, balanced, high-impedance, differential voltage amplifier utilizing ~~passive~~ a lossless feedback circuit;

at least two dipole probe elements connected to the amplifier, wherein the combination of the amplifier and the dipole probe elements produce an electric field sensing transduction mechanism for the reception of signals, and wherein the ~~active~~ antenna operates with a bi-directive reception pattern; and

a ~~tuned~~ scatter-plate subassembly ~~configured~~ that is tuned to direct received signals onto said at least two dipole probe elements; ~~[[.]]~~

wherein, a bias decoupling inductor is used to reduce noise contribution of the amplifier to the antenna, and wherein an inductance value of the bias decoupling inductor is selected such that an RF voltage peaking effect is obtained at a transistor input at a desired frequency.

20. (Currently Amended) The active antenna of claim 19, wherein the said ~~tuned~~ scatter-plate is further configured to operate with a directive reception pattern over multiple octaves of Radio Frequency (RF) spectrum with separate frequency-dependant directive modes, and wherein the scatter-plate is tuned such that the separate directive modes occur at ~~convenient~~ select areas of the RF frequency spectrum.

21. (Currently Amended) The active antenna of claim 19, wherein the lossless feedback circuit comprises a wire-wound transformer connected to a Field Effect Transistor (FET) or a high impedance transistor, and wherein gain of the differential voltage amplifier ~~gain~~ is scaled by turn-ratio of the wire-wound transformer ~~turn-ratio~~.

22. - 23. (Cancelled)